



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,930	12/16/2005	Heinz Futscher	D4695-00132	8653

8933 7590 09/28/2009
DUANE MORRIS LLP - Philadelphia
IP DEPARTMENT
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103-4196

EXAMINER

AFZALI, SARANG

ART UNIT	PAPER NUMBER
----------	--------------

3726

MAIL DATE	DELIVERY MODE
-----------	---------------

09/28/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,930	Applicant(s) FUTSCHER ET AL.	
	Examiner SARANG AFZALI	Art Unit 3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 12-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060621 and 20050606</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-7 and 12-17 in the reply filed on 6/29/2009 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The alternative language of at least one of "graphite", "another carbon" and "an organic and in-organic polymer" is very confusing. It is not clear as if the Applicant is claiming one of the first two limitations in addition to the third limitation or only one out of the three limitations? In addition, it is not clear as if the limitation of "graphitized after the application to the metal" recited in lines 4-5, refers back to the first limitation of "graphite" only or to any of the three limitations?

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Berger et al. (US 4,318,968).

As applied to claims 1 & 2, Berger et al. teach a method of making a battery wherein expanded metal is provided with a coating to improve electron conductivity (depositing metallic hydroxides) on a base metal prior to the metal being expanded or laminated or sintered (Fig. 1, Abstract, lines 1-17, col. 2, lines 8-58).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 3 as best as understood, 4, 12, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson et al. (US 6,465,121) in view of Berger et al. (US 4,318,968).

As applied to claims 1, 2, 12, 13, 15 and 16, Dawson et al. teach a method for manufacturing an electrochemical cell (lithium battery) comprising:

applying a coating to a closed metal foil, the coating improving at least one of adhesiveness and electron conductivity;

converting the closed metal foil into expanded metal, thereby providing a current collector;

Art Unit: 3726

laminating the expanded metal with an anode foil;

applying a coating to an additional closed metal foil, the coating improving at least one of adhesiveness and electron conductivity;

converting the additional closed metal foil into expanded metal only after applying the coating, thereby providing an additional current collector;

laminating the expanded metal from the additional closed metal foil with a cathode foil;

providing a separator foil and laminating together the current collector with the anode foil, the separator foil and the current collector with the cathode foil (Figs. 3 & 4, col. 1, lines 17-25, paragraph bridging cols. 4 & 5, col. 5, lines 41-57).

Dawson et al. do not explicitly teach that the metal foil is expanded only after the coating is applied.

However, Berger et al. teach that it is well known in the art of battery making to provide a coating to improve electron conductivity (depositing metallic hydroxides) on a base metal prior to the metal being expanded or laminated or sintered (col. 2, lines 53-58).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have provided Dawson et al. with the coating on the base metal prior to being expanded as taught by Berger et al., as an effective means of enhancing the electron conductivity of the base metal.

Art Unit: 3726

Alternatively, although Dawson et al. do not teach that the metal foil is expanded only after the coating is applied, it is noted that there are a limited number of choices available to a person of ordinary skill in the art for coating a base metal, either before or after expansion. In this regard, it is noted that Berger et al. teach that metal is coated before being expanded (col. 2, lines 53-58).

As such, it would have been obvious to one of ordinary skill in the art, at the time of invention, to coat the base metal of Dawson et al. prior to being expanded in order to enhance the electron conductivity of the expanded metal, since coating the metal before the expansion is also a suitable means of improving electron conductivity of the metal maintained even after being expanded.

Regarding claim 12, the limitation of "collecting a current by use of said expanded metal as a current collector with one of an anode foil and a cathode foil," note that both Dawson et al. and Berger et al. teach a method of manufacturing a battery, and as such, teach that a coated, expanded metal is used as a current collector to collect current associated with one of an anode foil and a cathode foil (Dawson, col. 1, lines 44-46).

As applied to claims 3 and 4, Dawson et al./Berger et al. teach the invention cited in claim 1. Dawson et al. further teach that the coating contains at least one of graphite, another carbon material with a binder and an organic and inorganic-organic polymer

Art Unit: 3726

(col. 4, lines 54-59) and that the metal comprises one of copper and aluminum (col. 4, lines 62-67, col. 5, lines 45-50).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson et al. (US 6,465,121) in view of Berger et al. (US 4,318,968) as applied to claim 1 above, and further in view of Yamamoto et al. (US 6,953,642).

Dawson et al./Berger et al. teach the invention cited with the exception of explicitly teaching the corona discharge surface treatment before the coating step.

However, Yamamoto et al. teach that it is well known in the art of battery making to subject the surface of an inductor body to corona discharge treatment before being coated, in order to improve the affinity and adhesion of the coating material to the inductor body (col. 1, lines 19-23, col. 27, lines 38-42).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have subjected the base metal of Dawson et al./Berger et al. to corona discharge treatment, since such treatment would enhance the affinity and adhesion of the coating layer to the base metal.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson et al. (US 6,465,121) in view of Berger et al. (US 4,318,968) as applied to claim 1 above, and further in view of Traini et al. (US 5,776,328).

Dawson et al./Berger et al. teach the invention cited with the exception of explicitly teaching the short and long diagonal lengths.

However, Traini et al. teach (col. 1, lines 19-23) that it is well known in the art of current collector and expanded metal forming to provide a base member with diamond shaped apertures with diagonals length in the range of 0.5 to 12 mm (which reads on both the claimed short length of up to 1 mm and long length of up to 2 mm) in order to optimize the current distribution with a consequently lower cell voltages during the electrolysis operation (col. 5, lines 49-56, col. 6, lines 37-44).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have provided the expanded metal of Dawson et al./Berger et al. with the apertures with claimed diagonal lengths, as taught by Traini et al., resulting in an efficient, optimized and highly reliable system.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson et al. (US 6,465,121) in view of Berger et al. (US 4,318,968) as applied to claim 1 above, and further in view of Larkin (US 6,306,215).

Dawson et al./Berger et al. teach the invention cited with the exception of explicitly teaching the claimed coating techniques.

However, Larkin teaches that it is well known in the art of battery making to provide an adhesion promoter coating on the surface of a current collector by h conventional methods such as spin coating and dipping (Abstract, lines 1-3, col. 5, lines 33-35).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have provided the coating to the base metal of Dawson et

al./Berger et al. using any of the conventional methods such as spin coating or dipping , as taught by Larkin, in order to provide an effective means of depositing a finished layer on the surface of the base metal.

11. Claims 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dawson et al. (US 6,465,121) in view of Berger et al. (US 4,318,968) as applied to claims 12 and 15 above, and further in view of Kejha et al. (US 2006/0159999).

As applied to claims 14 and 17, Dawson et al./Berger et al. teach the invention cited with the exception of explicitly teaching the foil is prepared without using a plasticizing agent.

However, Kejha al. teach that it is well known in the art of battery making to provide non-plasticized structural body used as electrodes allowing them to be more loaded with active materials for high energy density (paragraph [0043], 12-18).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have provided Dawson et al./Berger et al. with a non-plasticized electrode composition, as an effective means of enhancing the load capacity of the electrodes.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 3726

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARANG AFZALI whose telephone number is (571) 272-8412. The examiner can normally be reached on 7:00-3:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SARANG AFZALI/
Examiner, Art Unit 3726
9/25/2009

/DAVID P. BRYANT/
Supervisory Patent Examiner, Art Unit 3726